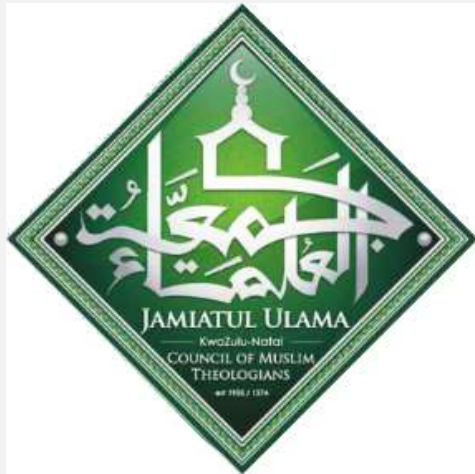


HILAAAL AND SALAAH TIMES

A WORKSHOP FOR ULAMA AND DARUL U'LOOM STUDENTS



JAMIATUL ULAMA

KwaZulu-Natal – South Africa

COUNCIL OF MUSLIM THEOLOGIAN

EDUCATING * ENLIGHTENING * SERVING

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PART 2

UNDERSTANDING PERPETUAL SALAAH TIMES AND THE JAMIAT'S PERPETUAL TIMETABLE

OBJECTIVES OF THIS PRESENTATION

1. Understanding the importance of astronomy in Deen
2. Factors that affect accuracy
3. Safety margins
4. The effects of refraction
5. Twilight
6. Familiarising ourselves with the timetable
7. Visualising concepts discussed in the Kitaabs
8. Determining The Qibla using the sun

WE MONITOR THE SUN AND MOON

We an Ummah who are required to monitor the movement of both the sun and the moon to fulfil our obligatory acts of Ibaadah to Allah.



WE MONITOR THE SUN AND MOON

We monitor the sun so that we can determine the times of Salaah, which are dependent on the position of the sun in the sky.



WE MONITOR THE SUN AND MOON

We monitor the moon for counting days and months, so that we can fulfil obligatory Ibaadah like fasting in month of Ramadaan and Hajj.



WE TRACK THE SUN AND MOON

It is in fact obligatory for Muslims to track the movement of both the moon and the sun, and we will become sinful if we do not do so.

الَّذِي أَحْسَنَ كُلَّ شَيْءٍ خَلَقَهُ

Who perfected everything which He created [32:7]



SALAAH TIMES ARE FIXED

إِنَّ الصَّلَاةَ كَانَتْ عَلَى الْمُؤْمِنِينَ كِتَابًا مَّوْقُوتًا

Indeed, prayer has been decreed upon the believers (at) specified times. [4:103]

THE PERPETUAL TIMETABLE

January

Date	Suhoor	Fajr	Sunrise	Zawwaal	Asr[S]	Asr[H]	Maghrib	Isha
1	3:18	3:23	4:58	11:59	15:35	16:52	19:03	20:36
2	3:19	3:24	4:59	12:00	15:35	16:52	19:04	20:36
3	3:19	3:24	5:00	12:00	15:36	16:53	19:04	20:36
4	3:20	3:25	5:01	12:01	15:36	16:53	19:04	20:36
5	3:21	3:26	5:01	12:01	15:37	16:53	19:04	20:36

FACTORS WHICH AFFECT ACCURACY

Accuracy = +/- 1 minute

1. Spherical trigonometry
2. Perpetual vs specific year
3. Wide metropolitan area (radius 25km)
4. Height above sea level
5. Computation of twilight not exact

FACTORS WHICH AFFECT ACCURACY

Therefore safety margins are applied.

Safety margins are also needed based on the fact that Musjid Clocks are not always maintained to seconds accuracy.

Perpetual times are intended to be safe and precautionary for the people.

DIFFERENCES IN NEARBY CITIES

January 1st, 2nd for **Durban**, **Camperdown**, and **Pietermaritzburg**

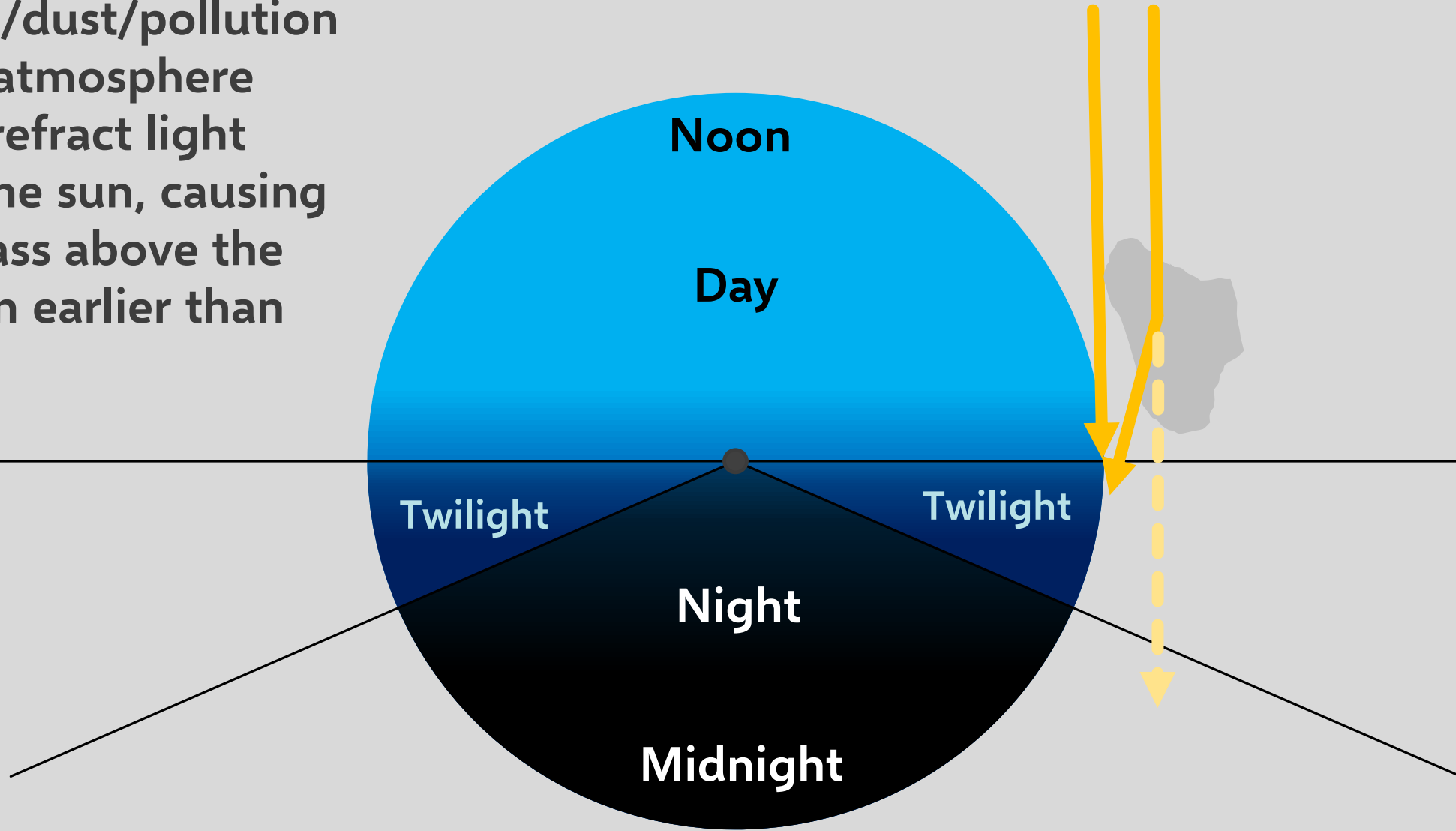
Date	Suhoor	Fajr	Sunrise	Zawwaal	Asr[S]	Asr[H]	Maghrib	Isha
=====								
1	3:18	3:23	4:58	11:59	15:35	16:52	19:03	20:36
1	3:20	3:25	5:01	12:01	15:36	16:53	19:05	20:37
1	3:21	3:26	5:02	12:02	15:36	16:54	19:05	20:37
2	3:19	3:24	4:59	12:00	15:35	16:52	19:04	20:36
2	3:21	3:26	5:02	12:02	15:37	16:54	19:05	20:37
2	3:22	3:27	5:02	12:02	15:37	16:54	19:05	20:37

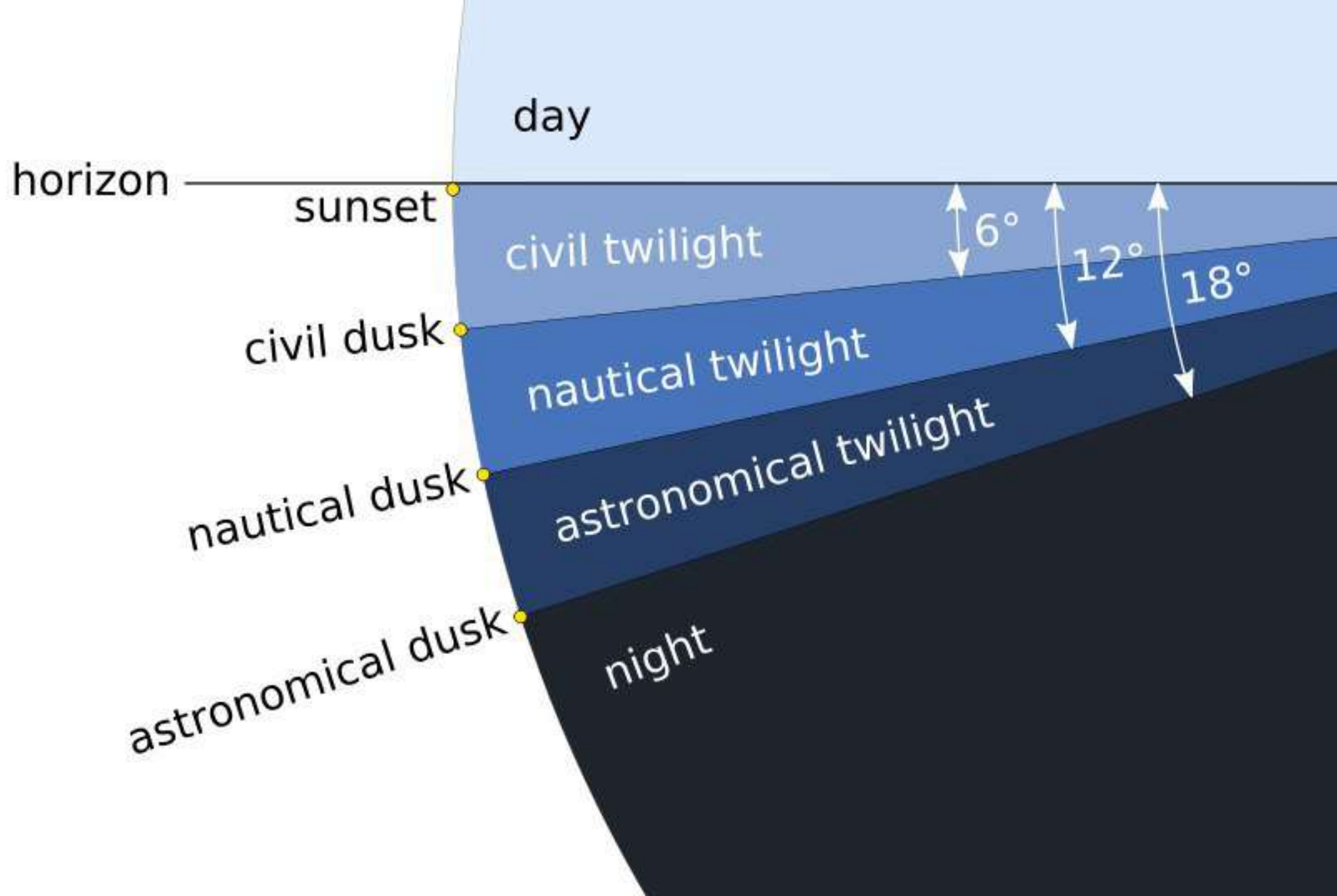
UNDERSTANDING REFRACTION

Refraction causes a change in the direction of a ray of light due to a change in the medium through which the light travels. In other words, when light travels from clear air into clouds/water/dust/pollution, light can bend.



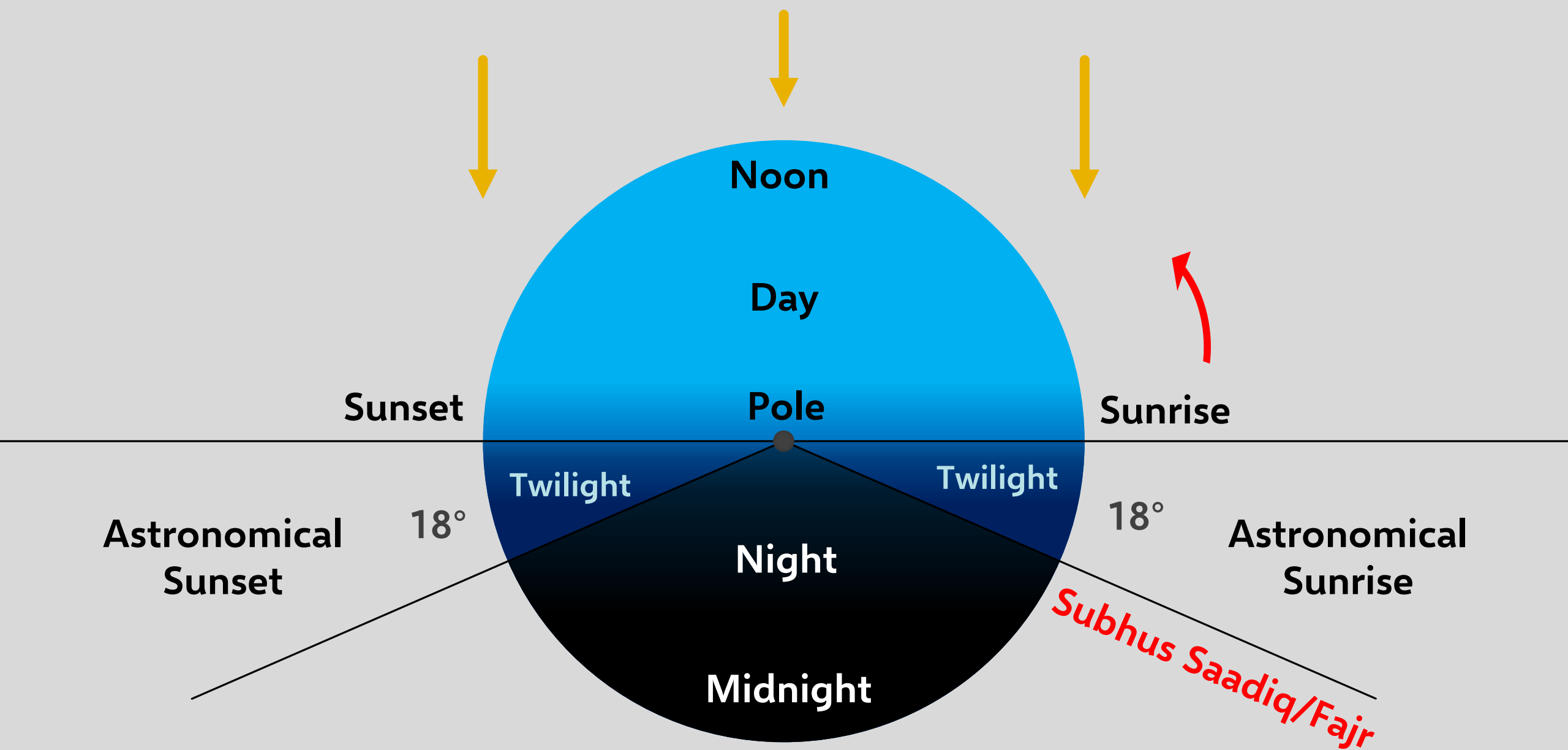
Clouds/dust/pollution
in the atmosphere
could refract light
from the sun, causing
it to pass above the
horizon earlier than
usual.





SUBHUS SAADIQ [TRUE DAWN]

The morning twilight appears when the sun is 18° below the Horizon (Astronomical Sunrise) – It is not possible to view this phenomenon in an illuminated urban area. At Subhus Saadiq, the sky starts to turn blue and most stars start to disappear.



TWILIGHT CONVENTIONS

Convention	Fajr Angle	'Ishā Angle
University of Islamic Sciences, Karachi	18°	18°
Islamic Society of North America	17.5° *	15°
Muslim World League	18°	17°
Umm al-Qura, Makkah	18° **	(90 min after Maghrib)
Egyptian General Authority of Survey	19.5°	-

A DEPRESSION ANGLE OF 18° OR MORE HISTORICALLY

Astronomy of Islamic Times for the Twenty-First Century by Dr Mohammad Ilyas

In modern times, astronomical twilight (18°) has come to be widely used for the determination of Isha and Fajr times. As the average intensity curve of evening twilight indicates, the flux decreases to a minimum level, and thus it would seem appropriate that even for Islamic purposes, this should indicate a reasonable starting value for the end of 'Astro-Islamic Twilight' (AIT). Indeed, 18° depression was a commonly used value for Fajr and Isha in the medieval period, when it must have been based on careful observations. Nevertheless, slight variations from this value- between 16° and 20°- were also used during the medieval period.

A DEPRESSION ANGLE OF 18° OR MORE HISTORICALLY

Astronomy of Islamic Times for the Twenty-First Century by Dr Mohammad Ilyas

According to King, 20° and 16° were the parameters used by Ibn Yunus for morning and evening AIT respectively, whereas 19° and 17° were the parameters used by various Egyptian astronomers. Nasr also refers to 19° being used in the Islamic world for the Fajr and Isha times. King has confirmed that although Muslim astronomers widely used 18°/18° symmetrical values or a slight variation to 19°/17° (morning/evening)-and in a few (earlier) cases even 20°/16° values were adopted-no record has been found of the use of a value as small as 15°.

MUFTI TAQI USMANI'S OPINION

Q) Living here in the Washington DC, USA, I would like to know if we should perform Fajr and Isha at 15° or 18°? Below is an excerpt from Khalid Shaukat's website. He is an expert in Astronomy here in the USA and holds the opinion that we should use 15°. I have also asked other Islamic Astronomers and they say that 18° is the more safer of the two. Please spread some light in this issue.

The website is moonsighting.com. It contains the following statement:

"Fajr & Isha are calculated for Sun being 15° below horizon, a value adopted by ISNA, which is based on sound principles of Qur'an and Sunnah, as applied in the light of modern scientific calculations." [Adil Khan]

MUFTI TAQI USMANI'S OPINION

A) After a good deal of research and continuous observation, my father, Mufti Muhammad Shafi, as well as other 99% of the Ulama in Pakistan and India, are unanimous on the point that the time of Isha and Fajr begins when the Sun is 18° below the horizon. This basis has been confirmed by scientific as well as religious research carried by a large number of scholars in both fields.

SUBHUL KAAZIB [FALSE DAWN]

The scientific term for a Subhul Kaazib is Zodiacal light. Zodiacal light is a faint, roughly triangular, white glow seen in the night sky that appears to extend up from the vicinity of the Sun. It is caused by sunlight that is scattered by space dust. During a Subhul Kaazib, The sky remains dark and many stars are visible.

COMPARISON BETWEEN THE TWO DAWNS

Subhul Kaazib



Subhus Saadiq



SUHOOR

The Suhoor times printed are 5 minutes before the time of Subhus Saadiq (Fajr). This is a safety margin to counter the effects of refraction.

Date	Suhoor	Fajr	Sunrise	Zawwaal	Asr[S]	Asr[H]	Maghrib	Isha
1	3:18	3:23	4:58	11:59	15:35	16:52	19:03	20:36
2	3:19	3:24	4:59	12:00	15:35	16:52	19:04	20:36

FAJR

Fajr starts at Subhus Saadiq. Fajr Azaan can only be given once the stipulated time has set in.

Date	Suhoor	Fajr	Sunrise	Zawwaal	Asr[S]	Asr[H]	Maghrib	Isha
1	3:18	3:23	4:58	11:59	15:35	16:52	19:03	20:36
2	3:19	3:24	4:59	12:00	15:35	16:52	19:04	20:36

SUNRISE

The Sunrise time shown is the time at which Sunrise Starts. Salaah is not allowed from the time of Sunrise Starts, all the way up to the time of Ishraaq, which is approximately 15 minutes after Sunrise Starts.

Date	Suhoor	Fajr	Sunrise	Zawwaal	Asr[S]	Asr[H]	Maghrib	Isha
1	3:18	3:23	4:58	11:59	15:35	16:52	19:03	20:36
2	3:19	3:24	4:59	12:00	15:35	16:52	19:04	20:36

SUNRISE

LEFT TO RIGHT



Sunrise Starts



6:00

Sunrise Ends



6:03

Ishraaq



6:15

ZAWWAAL

The time at which the sun is at its mid-point in the sky (Istiwa) is *commonly referred to as "Zawwaal"*. Zuhr begins when the sun has passed the mid-point (actual Zawwaal). Typically, the time 5 minutes before and after Istiwa is regarded as a forbidden time.

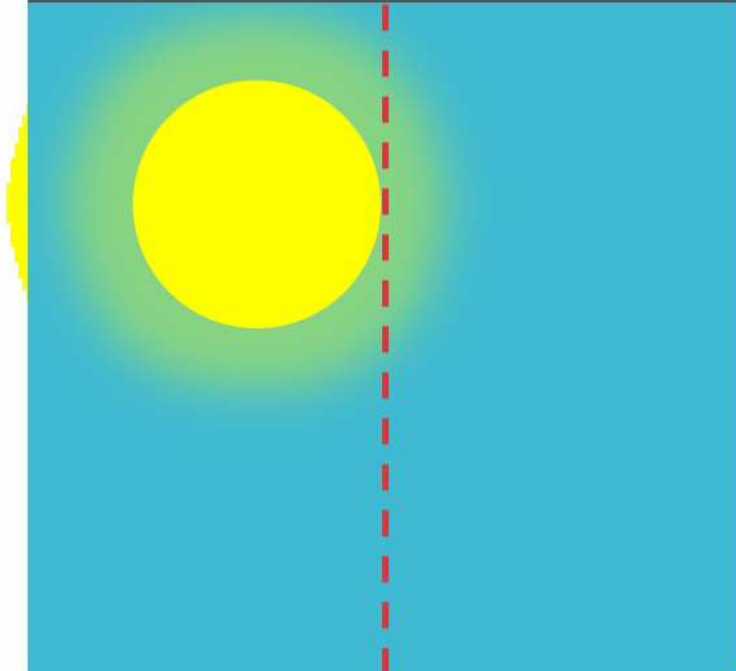
Date	Suhoor	Fajr	Sunrise	Zawwaal	Asr[S]	Asr[H]	Maghrib	Isha
1	3:18	3:23	4:58	11:59	15:35	16:52	19:03	20:36
2	3:19	3:24	4:59	12:00	15:35	16:52	19:04	20:36

ISTIWA (ZAWWAAL)

RIGHT TO LEFT

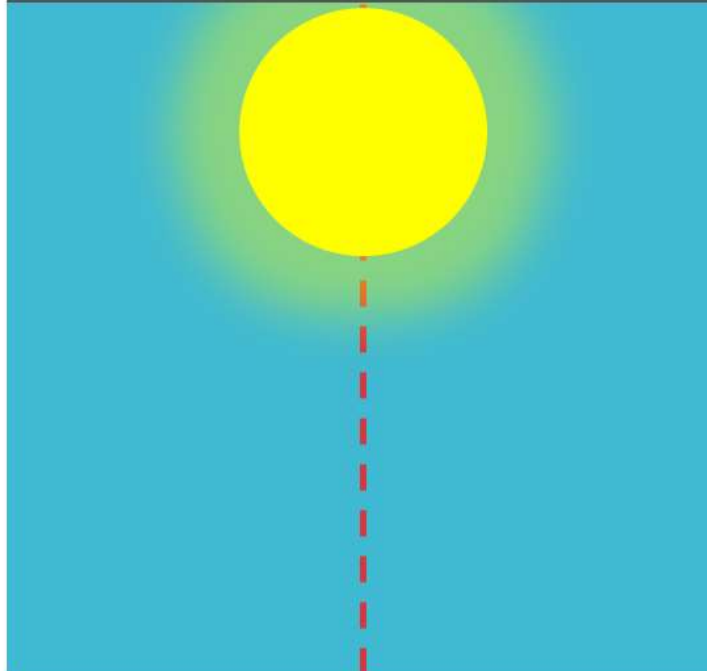


Forbidden Time Ends



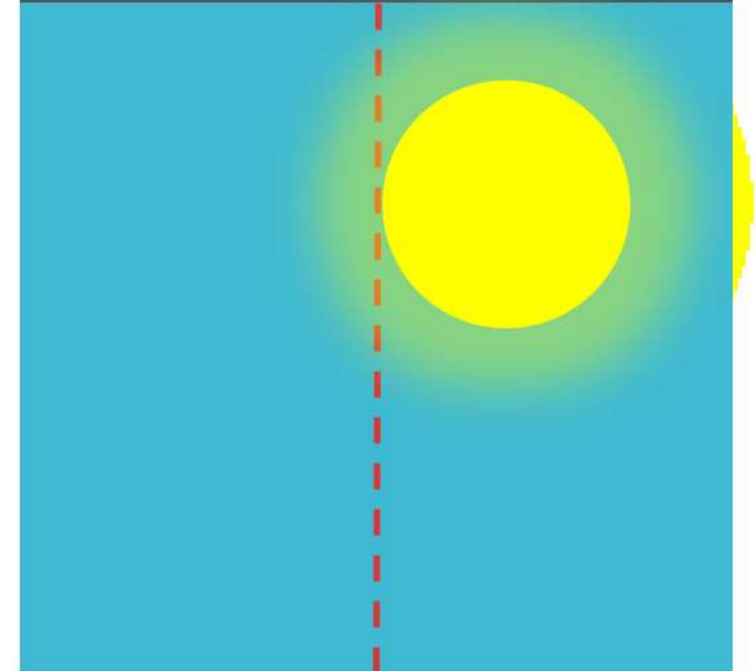
12:05

Forbidden Time Mid



12:00

Forbidden Time Starts



11:55

ASR [SHAFI]

Asr begins when the length of the shadow of an object is equal to the length of the object plus the object's minimum length of shadow (at Istiwa).

Date	Suhoor	Fajr	Sunrise	Zawwaal	Asr[S]	Asr[H]	Maghrib	Isha
1	3:18	3:23	4:58	11:59	15:35	16:52	19:03	20:36
2	3:19	3:24	4:59	12:00	15:35	16:52	19:04	20:36

ASR [SHAFI]

RIGHT TO LEFT



Asr Time [Shafi] 3:20

Stick: 1m
Shadow: 1,3m

Istiwa (Zawwaal) 12:00

Stick: 1m
Shadow: 0,3m

ASR [HANAFI]

Asr begins when the length of the shadow is **TWICE** the length of the object plus the object's minimum length of shadow (at Istiwa).

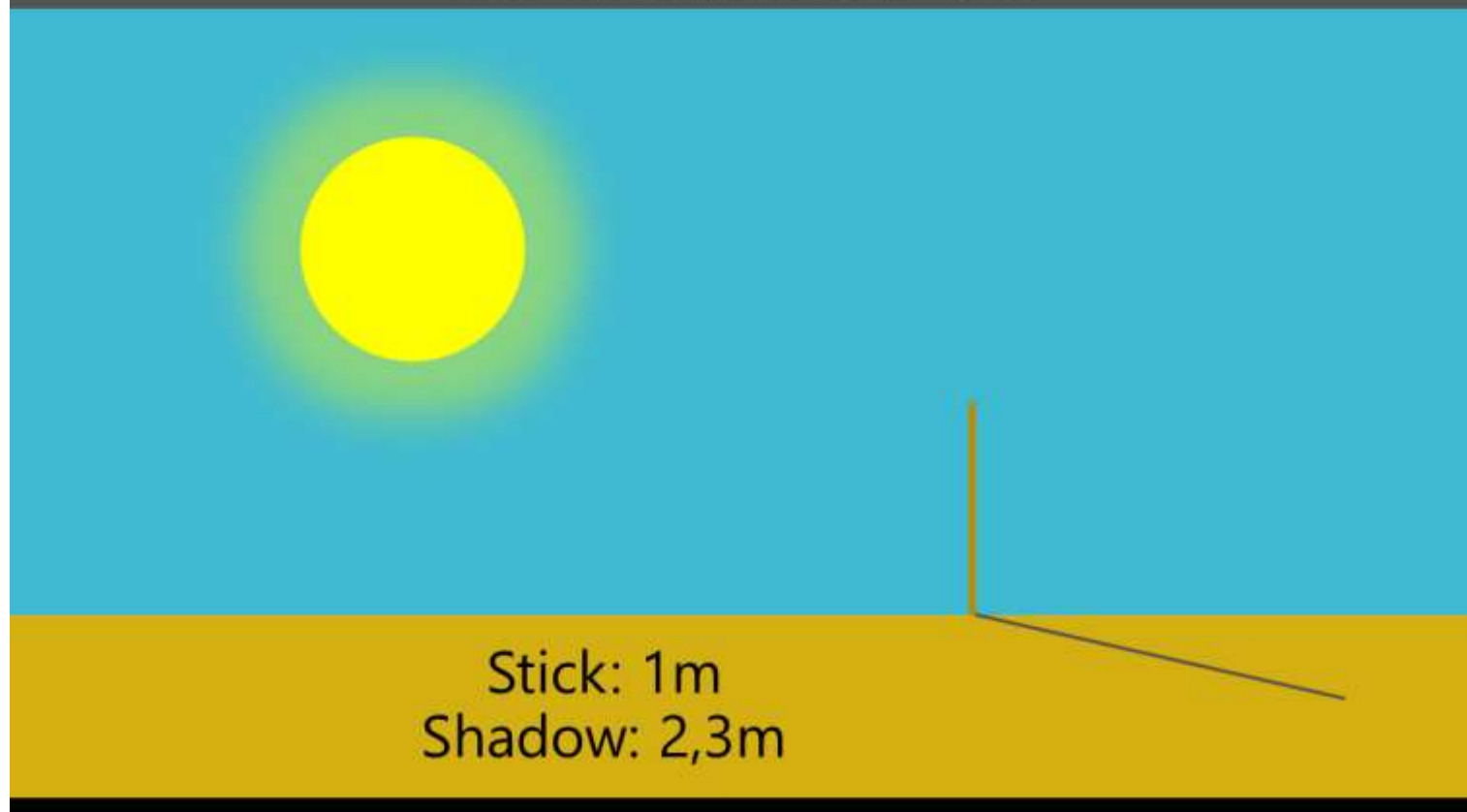
Date	Suhoor	Fajr	Sunrise	Zawwaal	Asr[S]	Asr[H]	Maghrib	Isha
1	3:18	3:23	4:58	11:59	15:35	16:52	19:03	20:36
2	3:19	3:24	4:59	12:00	15:35	16:52	19:04	20:36

ASR [HANAFI]

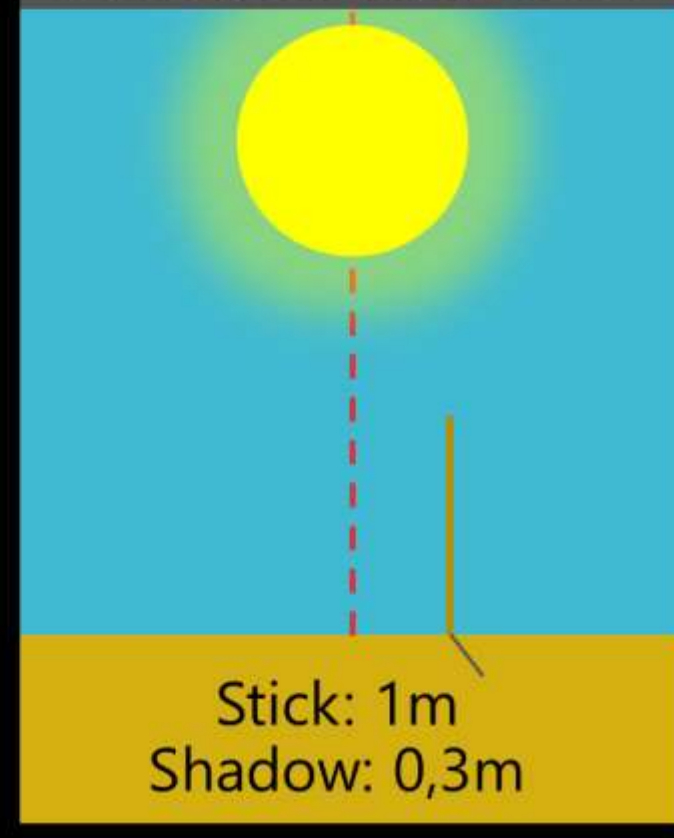
RIGHT TO LEFT



Asr Time [Hanafi] 4:40



Istiwa (Zawwaal) 12:00



SUNSET

Sunset times are not usually displayed on timetables. If it is present, it usually refers to the time at which Sunset ends, thus Sunset actually starts 3 minutes before the published time.

Date	Suhoor	Fajr	Sunrise	Zawwaal	Asr[S]	Asr[H]	Maghrib	Isha
1	3:18	3:23	4:58	11:59	15:35	16:52	19:03	20:36
2	3:19	3:24	4:59	12:00	15:35	16:52	19:04	20:36

MAGHRIB

Maghrib begins when the sun has completely set. Usually, a 3 minute safety margin is added to the Sunset time. The Maghrib time shown is 6 minutes after Sunset starts.

Date	Suhoor	Fajr	Sunrise	Zawwaal	Asr[S]	Asr[H]	Maghrib	Isha
1	3:18	3:23	4:58	11:59	15:35	16:52	19:03	20:36
2	3:19	3:24	4:59	12:00	15:35	16:52	19:04	20:36

SUNSET & MAGHRIB

LEFT TO RIGHT



Sunset Starts



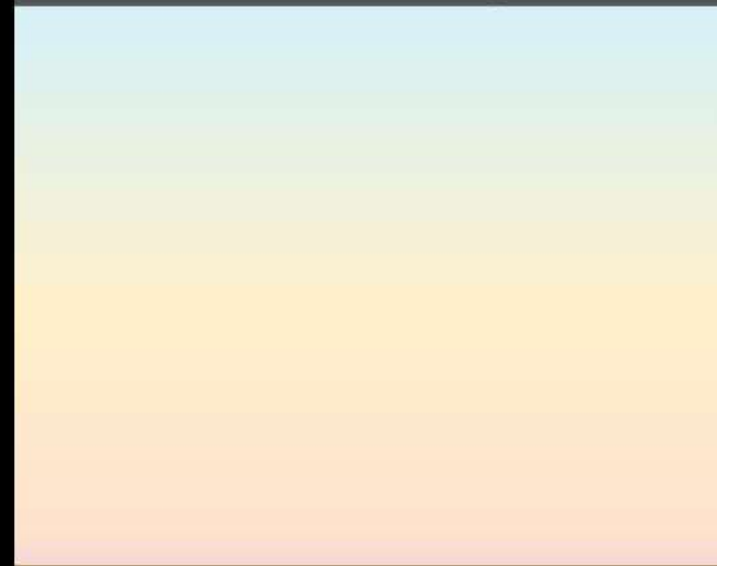
6:00

Sunset Ends



6:03

Published Maghrib

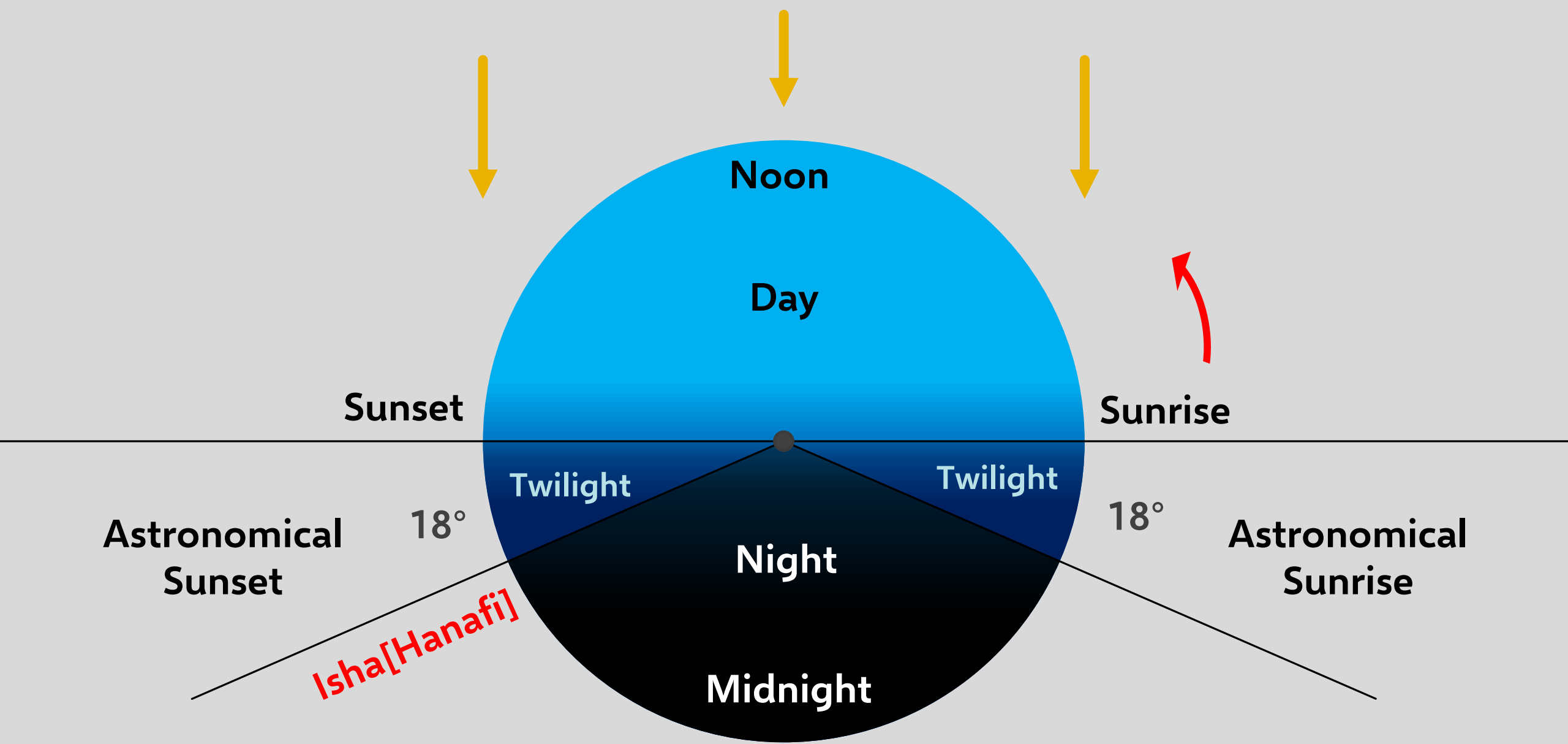


6:06

ISHA [HANAFI]

Isha starts after dusk when the evening twilight completely disappears. The evening twilight completely disappears when the sun has set 18° below the Horizon (Astronomical Sunset) – It is not possible to view this phenomenon in an illuminated urban area.

Date	Suhoor	Fajr	Sunrise	Zawwaal	Asr[S]	Asr[H]	Maghrib	Isha
1	3:18	3:23	4:58	11:59	15:35	16:52	19:03	20:36
2	3:19	3:24	4:59	12:00	15:35	16:52	19:04	20:36



PART 3

ACCURATELY DETERMINING THE QIBLA USING THE SUN

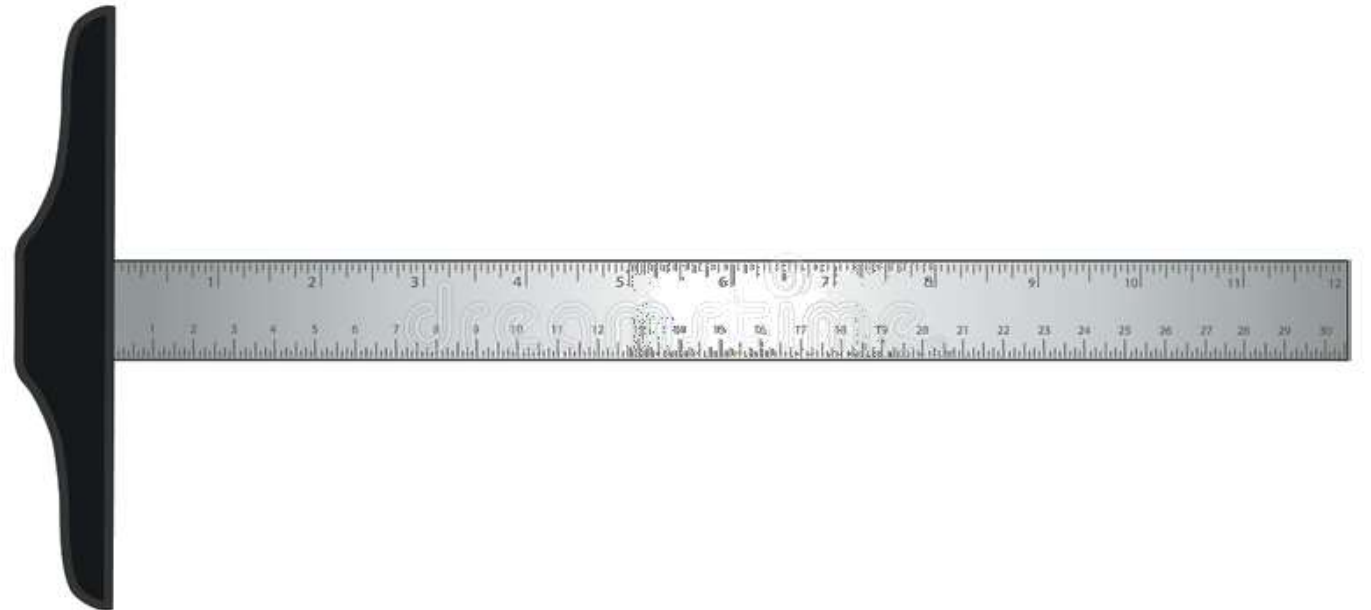


REQUIREMENTS

- A3 sheet of white paper
- Pen or pencil
- Tape

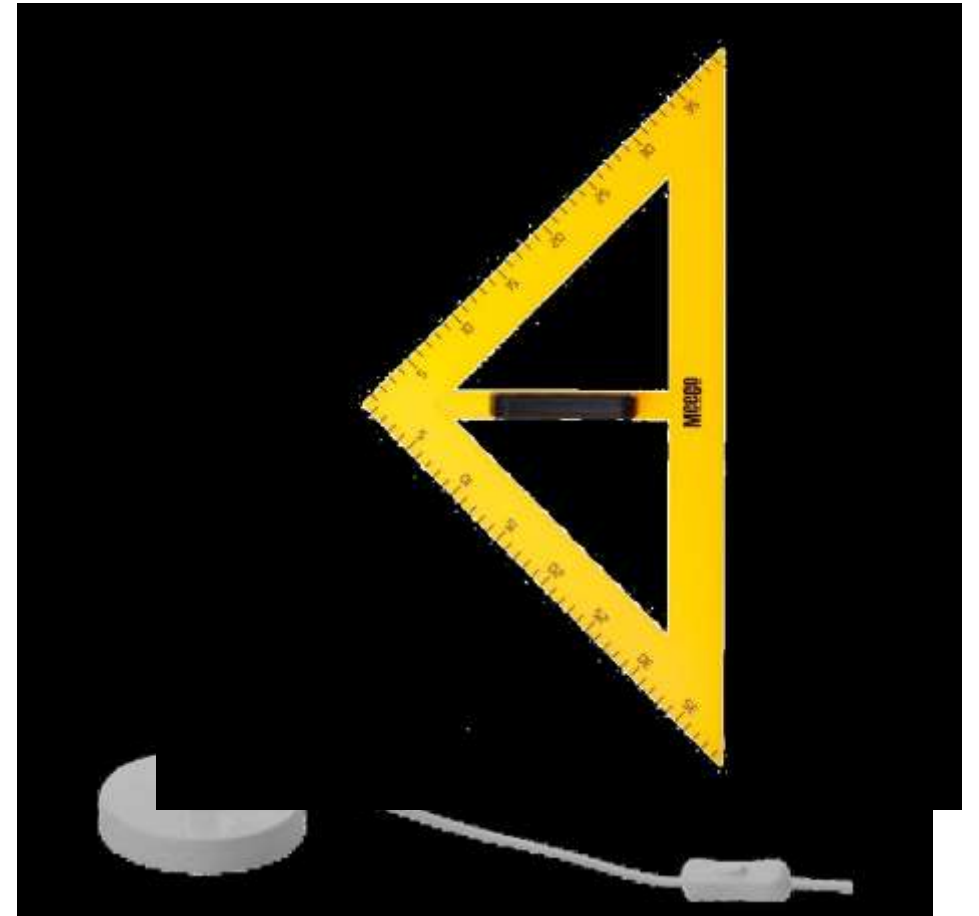
REQUIREMENTS

- Protractor
- Ruler or T-square



REQUIREMENTS

- 90° triangle (if no T-square)
- Self-standing pole at least 30cm in height, like the base of a bedside lamp



REQUIREMENTS

- Knowledge of the bearing of the Qibla (from Google Maps or software application) for the place in question (e.g. Durban is 10.5°)

qiblaway.com

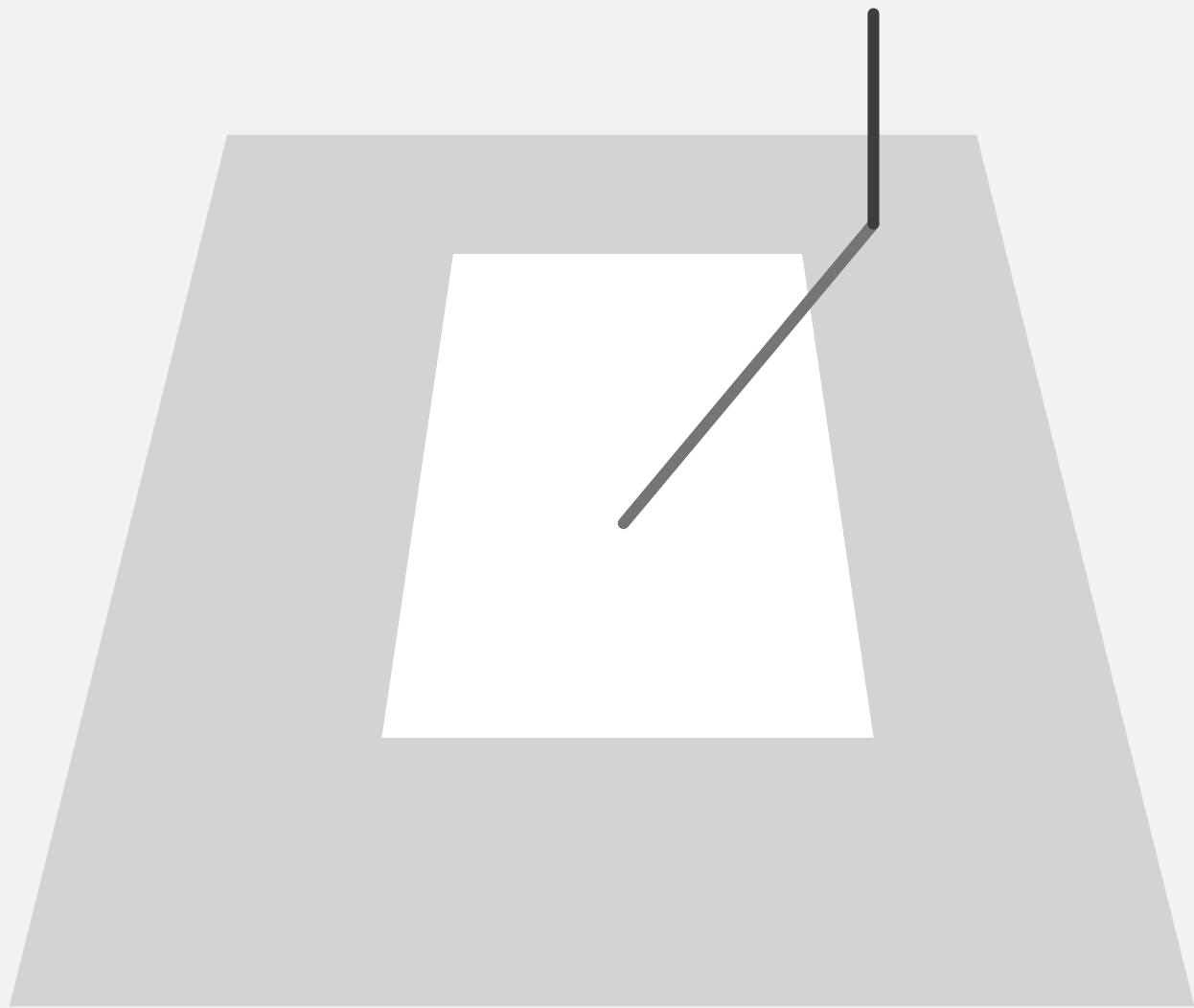
islamicfinder.org/Qibla-Direction

METHOD

1. About 5 minutes before Zawwaal (Istiwa), move to an area (preferably inside the Musjid) where the sun shines.
2. Place the A3 sheet of paper in the sun, with its edge aligned to a wall of the building (if outside, then aligned to a boundary line or wall).
3. Tape the page down so that it does not move.

METHOD

4. Place the self standing pole near the page such that you get a clear shadow of the pole near the middle of the page.
5. Wait for Zawwaal (Istiwa) time. At Istiwa time, the shadow of the pole will be aligned exactly on the North-South axis.



METHOD

6. Rule a line along the shadow. One end of the line will point North, and the other South.
7. Work out which end is North from the direction in which the sun rose. If one has one's right shoulder facing in an easterly direction, then one is facing a northerly direction.

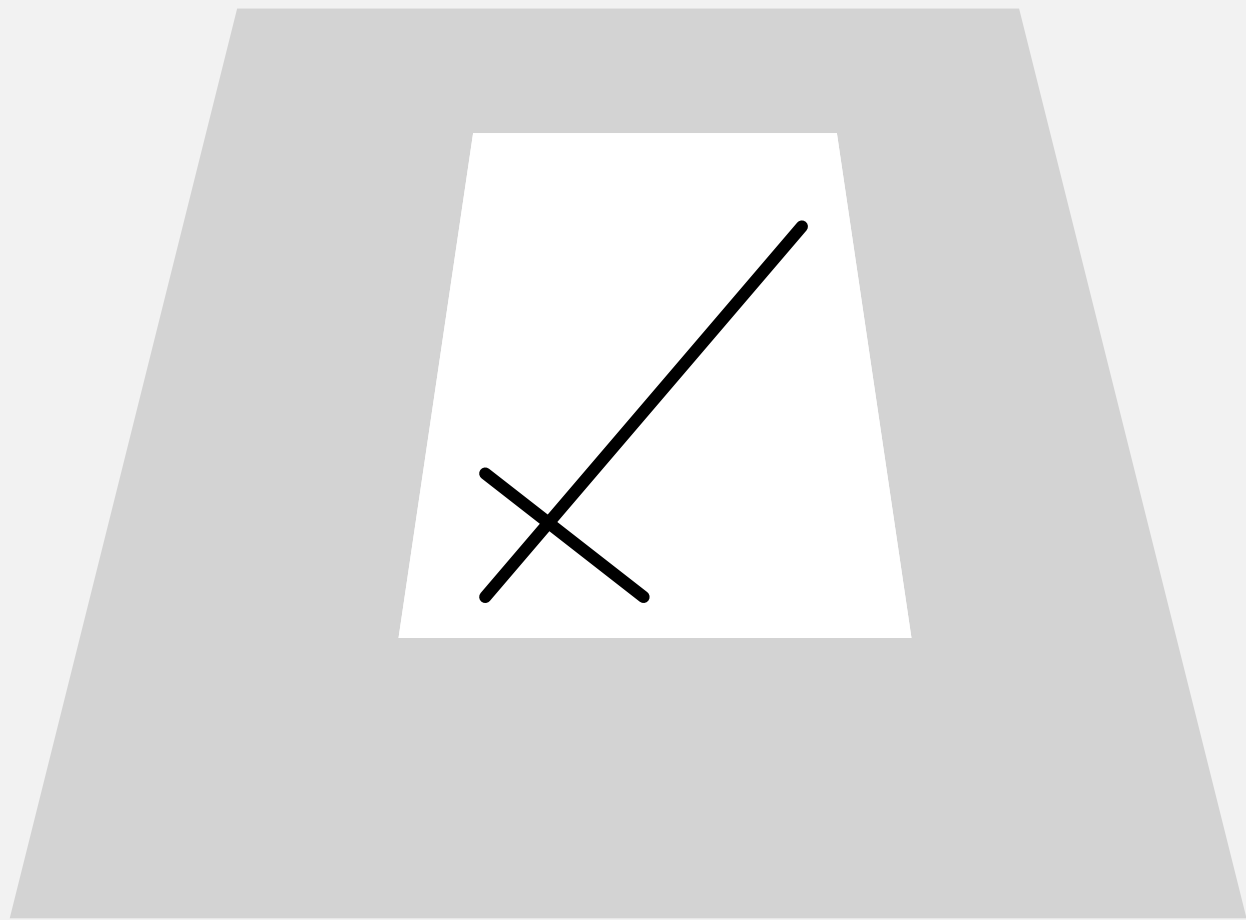


METHOD

If you are not sure about where the sun rose, then observe its movement for about 20 minutes - it will be moving westerly.

METHOD

8. Use the ruler or T-Square to draw a perpendicular line (90°) across the North-South line.

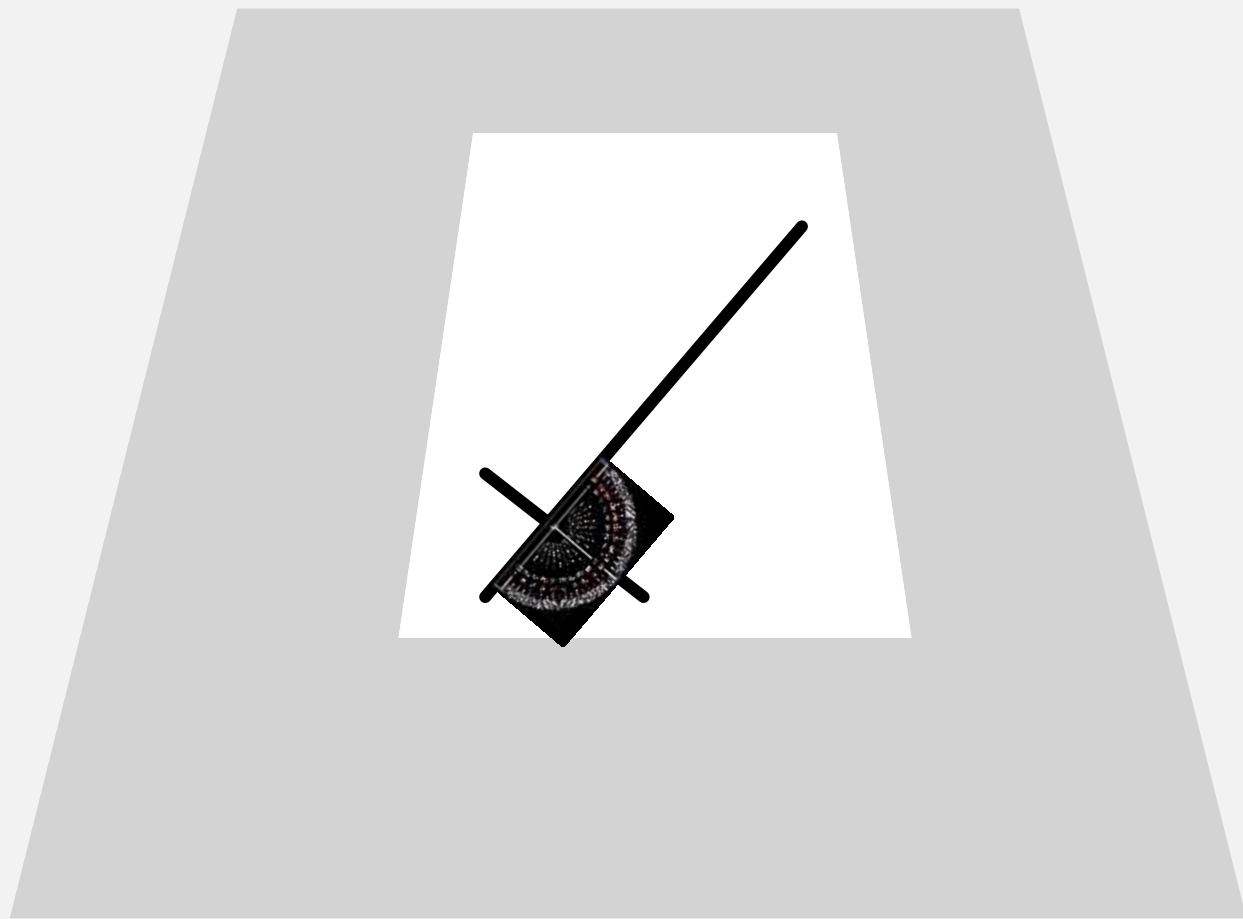


METHOD

9. Place the centre-point of the protractor on the intersection of these lines, with 0° on the protractor aligned with north.

METHOD

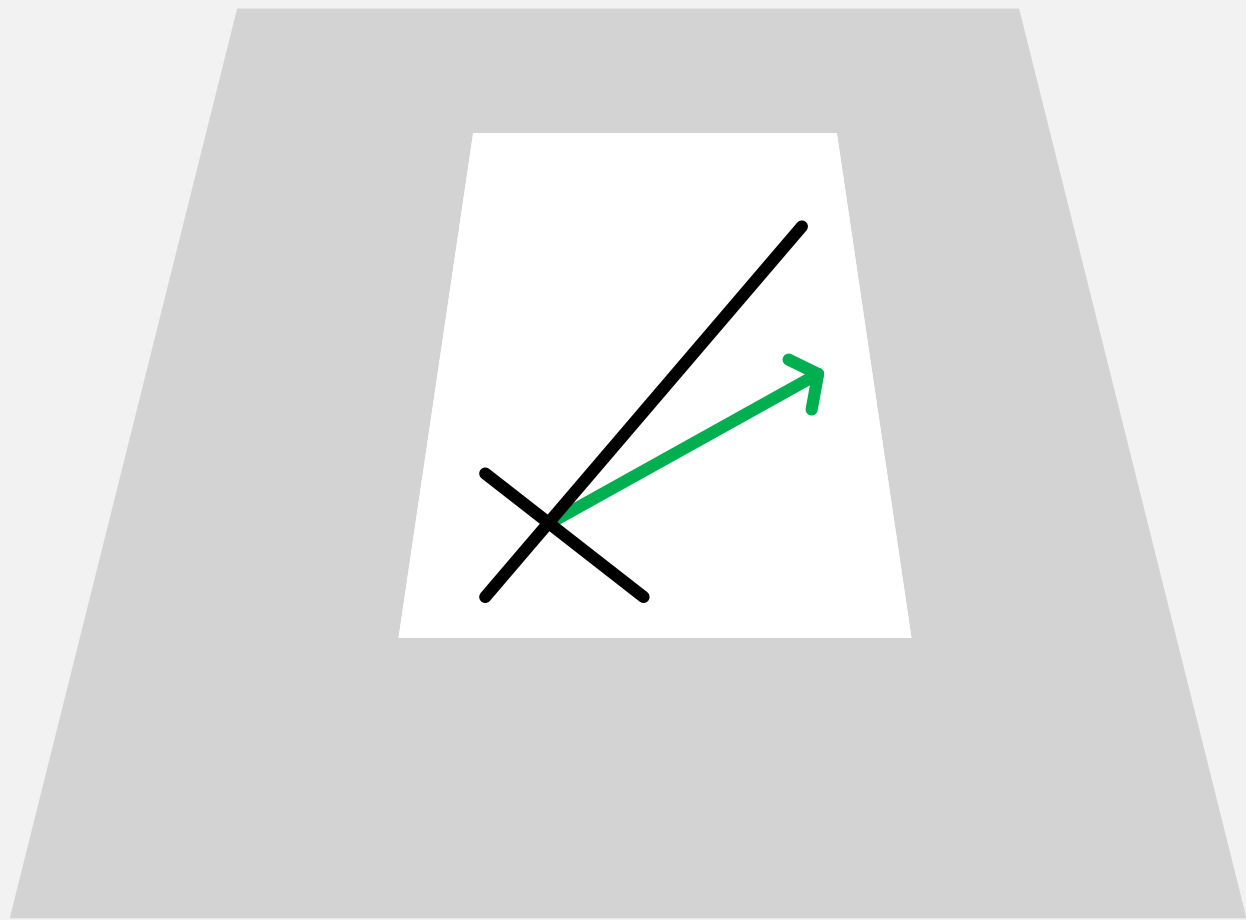
10. Mark off using the protractor the bearing of the place (from 0° north), which you previously obtained. If it is a 180° protractor, and the bearing is more than 90° , rotate the protractor so you can measure more than 90° .



METHOD

11. Draw a line from the protractor marking to the intersection point of the two previous lines.

This line is the Qibla direction, pointing away from the intersection point.



METHOD

12. You may now un-tape the page. At any time, the page can be realigned to whatever it was originally aligned to (in step 2), to re-determine the Qibla direction (e.g. when they come to put the carpets).

End of Presentation

